

In the Claims

Please amend the claims as indicated below.

PENDING CLAIMS AND STATUS THEREOF

1. (currently amended) A setting tool, comprising:

an outer sleeve;

an inner mandrel coaxially disposed within the outer sleeve and adapted to move axially relative to the outer sleeve;

first means for locking the inner mandrel into a first predetermined axial position relative to the outer sleeve;

means for biasing the inner mandrel into a second predetermined axial position relative to the outer sleeve; ~~and~~

second means for locking the inner mandrel into the second predetermined axial position; and

wherein the first locking means comprises a locking ring housing disposed between the inner mandrel and the outer sleeve, wherein the locking ring housing is adapted to be axially movable relative to the inner mandrel and outer sleeve.

2. (canceled).

3. (currently amended) The setting tool of claim 2 1 further comprising a housing connection attached to the inner mandrel, wherein the first locking means further comprises a piston pin housing disposed between the housing connection and the locking ring housing.
4. (original) The setting tool of claim 3 further comprising:

a first O-ring to seal the locking ring housing to the inner mandrel; and

a second O-ring to seal the locking ring housing to the housing connection.
5. (original) The setting tool of claim 4 wherein the first locking means further comprises a first shear pin adapted to fail under a predetermined load, wherein the first shear pin temporarily secures the locking ring housing to the piston pin housing.
6. (original) The setting tool of claim 5 wherein the first locking means further comprises at least one locking lug that is disposed between a flanged end of the locking ring housing, the outer sleeve, and the inner mandrel, wherein the at least one locking lug prevents movement of the inner mandrel relative to the outer sleeve.
7. (original) The setting tool of claim 6 wherein the at least one locking lug comprises four locking lugs spaced equidistant from one another around an outer circumference of the inner mandrel.
8. (original) The setting tool of claim 7 wherein the first locking means further comprises a shear coupling disposed between the inner mandrel and the outer sleeve, wherein the shear coupling has a shoulder against which a flanged-shaped portion of the inner mandrel abuts.

9. (original) The setting tool of claim 8 wherein the first locking means further comprises a second shear pin adapted to fail under a predetermined load, wherein the second shear pin temporarily secures the shear coupling to the outer sleeve to prevent movement of the inner mandrel relative to the outer sleeve.

10. (original) The setting tool of claim 9 wherein the predetermined load necessary to cause the second shear pin that temporarily secures the shear coupling to the outer sleeve to fail is greater than the predetermined load necessary to cause the first shear pin that temporarily secures the locking ring housing to the piston pin housing to fail.

11. (original) The setting tool of claim 1 wherein the first locking means further comprises a shear coupling disposed between the inner mandrel and the outer sleeve, wherein the shear coupling has a shoulder against which a flanged-shaped portion of the inner mandrel abuts.

12. (original) The setting tool of claim 11 wherein the first locking means further comprises a shear pin adapted to fail under a predetermined load, wherein the shear pin temporarily secures the shear coupling to the outer sleeve to prevent the inner mandrel from moving relative to the outer sleeve.

13. (original) The setting tool of claim 1 wherein the biasing means comprises a helical spring, wherein a first end of the helical spring engages a shoulder formed in the inner mandrel and a second end of the helical spring engages a shoulder formed in the outer sleeve.

14. (original) The setting tool of claim 1 wherein the second locking means comprises:

a locking key disposed in a first groove in the outer sleeve; and

a spring, wherein the spring forces the locking key into a second groove formed in the inner mandrel when the inner mandrel is in the second predetermined axial position thereby preventing movement of the inner mandrel relative to the outer sleeve.

15. (original) The setting tool of claim 1 wherein the first predetermined axial position is a run-in position.

16. (canceled)

17. (original) A setting tool, comprising:

an outer sleeve;

an inner mandrel coaxially disposed within the outer sleeve and adapted to move axially relative to the outer sleeve;

a locking ring housing disposed between the inner mandrel and the outer sleeve, wherein the locking ring housing is adapted to move axially relative to the inner mandrel and outer sleeve;

a housing connection ~~attached to the inner mandrel~~ disposed within the outer sleeve;

a piston pin housing disposed between the housing connection and the locking ring housing;

a first shear pin adapted to fail under a predetermined load, wherein the first shear pin temporarily secures the locking ring housing to the piston pin housing; and

at least one locking lug disposed between a flanged end of the locking ring housing and the inner mandrel, wherein the at least one locking lug ~~locks~~ prevents movement of the inner mandrel relative to the outer sleeve.

18. (original) The setting tool of claim 17 further comprising:

a first O-ring to seal the locking ring housing to the inner mandrel; and

a second O-ring to seal the locking ring housing to the housing connection.

19. (original) The setting tool of claim 17 wherein the at least one locking lug comprises four locking lugs spaced equidistant from one another around an outer circumference of the inner mandrel.

20. (original) The setting tool of claim 17 further comprising a shear coupling disposed between the inner mandrel and the outer sleeve, wherein the shear coupling has a shoulder against which a flanged-shaped portion of the inner mandrel abuts.

21. (original) The setting tool of claim 20 further comprising a second shear pin adapted to fail under a predetermined load, wherein the second shear pin temporarily secures the shear coupling to the outer sleeve to prevent movement of the inner mandrel relative to the outer sleeve.

22. (original) The setting tool of claim 21 wherein the predetermined load necessary to cause the second shear pin that temporarily secures the shear coupling to the outer sleeve to fail is greater than the predetermined load necessary to cause the first shear pin that temporarily secures the locking ring housing to the piston pin housing to fail.

23. (original) The setting tool of claim 17 further comprising a helical spring, wherein a first end of the helical spring engages a shoulder formed in the inner mandrel and a second end of the helical spring engages a shoulder formed in the outer sleeve.

24. (original) The setting tool of claim 17 further comprising:

a locking key disposed in a first groove in the outer sleeve; and

a spring, wherein the spring forces the locking key into a second groove formed in the inner mandrel thereby preventing movement of the inner mandrel relative to the outer sleeve.